

IT IS CLAIMED:

1. An apparatus for routing packets from a first network node to a second network node in a data network, comprising:

5 means for assigning an ID to the first node that is associated with at least one VPN, wherein the ID is assigned by an entity other than the first node;

means for receiving a packet from the first node, said packet including the ID associated with said first node, and including routing information for routing said packet to a destination address associated with said second node;

10 means for examining the packet to identify the ID of the first node; and

means for using said first node ID and routing information to determine whether said first node is associated with at least one VPN.

15 2. The apparatus of claim 1 further comprising means for routing the packet to the second node.

3. An apparatus of associating nodes in a data network with at least one virtual private network (VPN), the data network including an access network having at least one Head End device and a plurality of nodes, the access network further including at least one shared access channel utilized by a first and a second node of the plurality of nodes to communicate with the Head End device, said apparatus comprising:

means for assigning an address to the first node that is associated with at least one VPN, wherein the address is assigned by an entity other than the first node;

means for receiving a communication from the first node in the access network;

25 means for identifying the address of the first node, wherein the address is specific to the network on which the first node resides; and

means for using said address to determine whether said first node is associated with at least one VPN.

4. The apparatus of claim 3 further comprising means for mapping said first node to a particular sub-interface on the access network.

5. An apparatus of associating nodes in a data network with at least one virtual private network (VPN), the data network including an access network having at least one Head End device and a plurality of nodes, the access network further including at least one shared access channel utilized by a first and a second node of the plurality of nodes to communicate with the Head End device, said apparatus comprising:

means for determining whether said first node is a member of at least one VPN;
10 and

means for if it is determined that said first node is a member of at least one VPN, binding an ID of said node with said VPN to thereby cause said first node to be associated with said VPN, wherein the ID is bound with the node by an entity other than the node.

15 6. The apparatus of claim 5 further including means for mapping a particular sub-interface of the Head End to said particular VPN.

7. The apparatus of claim 22 further comprising:

means for receiving at said Head End device a packet from said first node, said
20 packet including a destination address corresponding to a second node in the network;

means for examining said packet to identify the ID of said first node; and

means for using said ID at said Head End device to determine whether said first node is a member of at least one VPN.

25 8. The apparatus of claim 7 further comprising:

means for if it is determined that said first node is a member of a first VPN, determining at said Head End device whether the destination address of said packet is within said first VPN.

9. The apparatus of claim 7 further comprising means for routing the packet to the second node.

10. An apparatus for configuring a Head End of an access network to route
5 packets from a first node to a second node in the access network, the apparatus comprising:

means for associating particular network nodes on the access network with at least one corresponding virtual private network;

means for assigning to the first node an ID specific to the access network, wherein
10 the ID is assigned to the first node by an entity other than the first node; and

means for associating the assigned ID with the first VPN to thereby cause the first node to be associated with the first VPN.

11. The apparatus of claim 10 further means for including mapping a particular
15 sub-interface of the Head End to the first VPN.